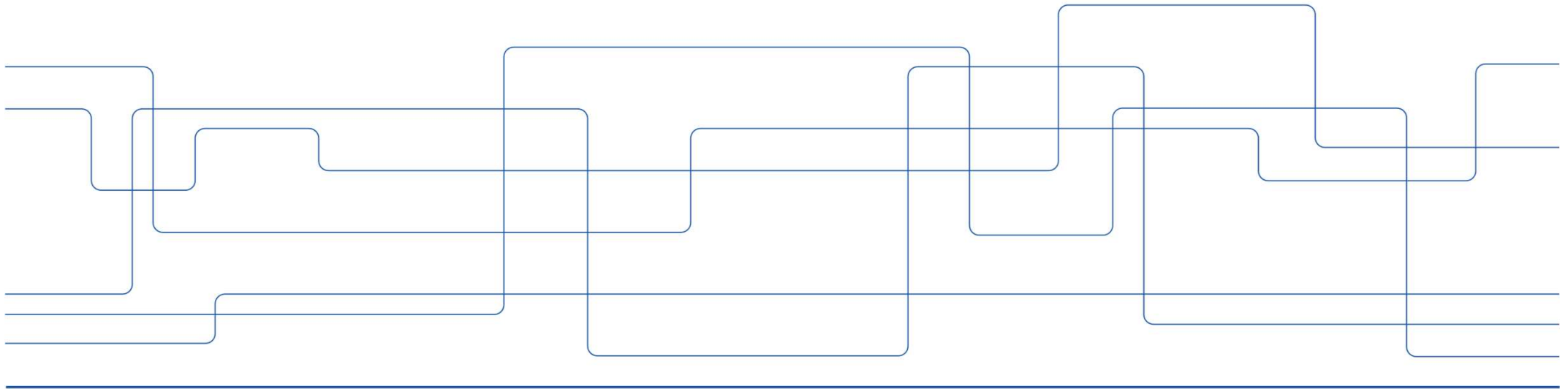




The future of education

Change program at KTH –

Joakim Lilliesköld – EECS & Program Director Future Education





Many universities have initiated change programs

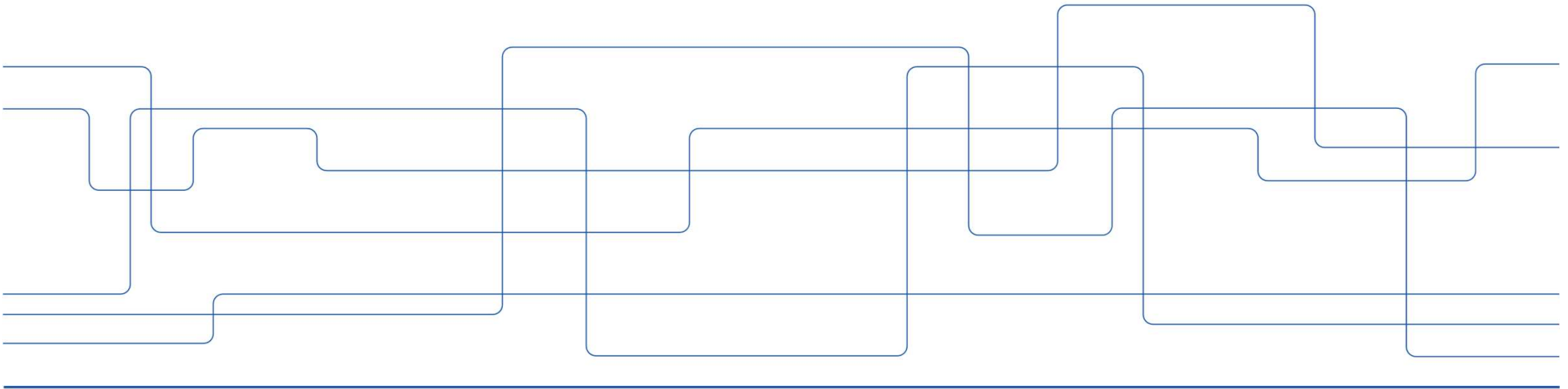
– Even though everyone is pretty worn out after years of pandemic!

- Major societal changes
 - Changing needs of our potential students
 - Climate challenges
 - Our education needs to be constantly developed to be relevant in this ever increasing pace of change!
- Will the post-covid era increase or decrease the need for development in our education?
- Many of the universities we compare ourselves with are making similar efforts to develop their education



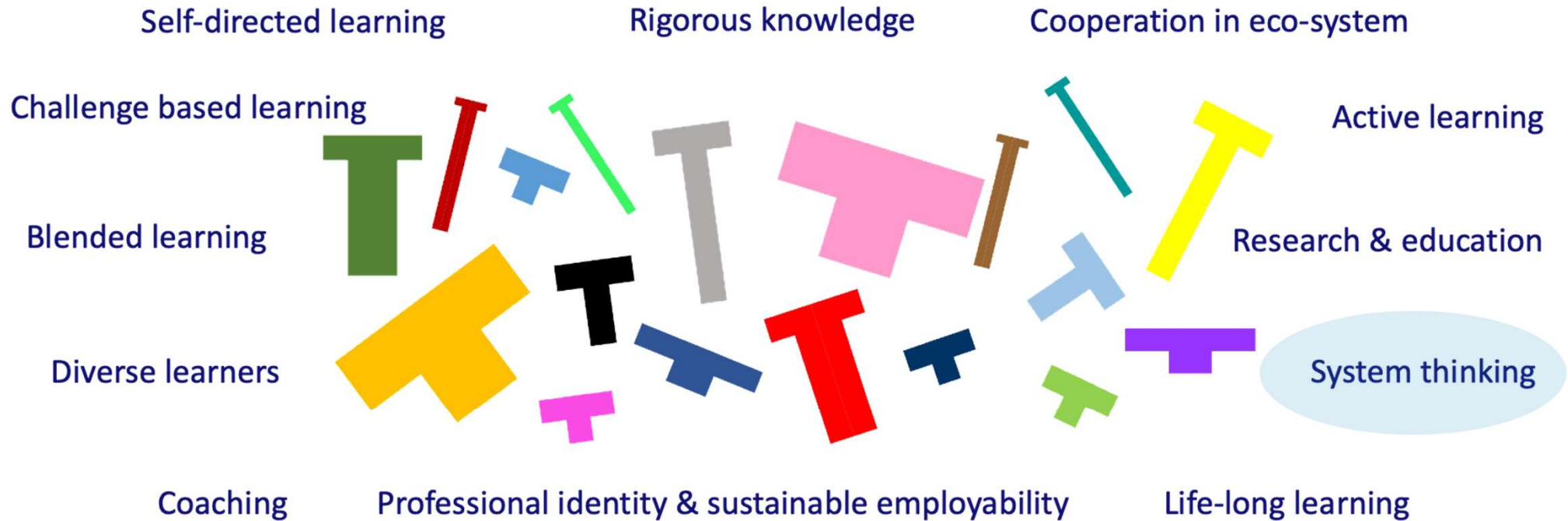


Global outlook



TU/e

Educational vision 2030





Three dimensions of education (Biesta)

Qualification

Provide students with the **knowledge, skills, and competences** they need to function in their future professional lives

Socialization

Acquaint students with **professional traditions**, let them reflect on the meaning, **norms and values** of engineering

Subjectification

Enable students to work on **personal growth/maturation**, develop an identity and discover their motives and passions

TU Delft

As students, our future engineers

1. Own their own curriculum
 2. Show true respect for other disciplines
 3. Are able to apply their knowledge in a changing field
 4. Can reflect on themselves and their colleagues
 5. Know how to design their life
 6. Master transferable skills, teamwork, decision making, communication, planning, prioritization
 7. Have knowledge of AI, digital skills, climate, open data, entrepreneurship
-



NTNU – Framtidens teknologiestudier projekt

Visjon

NTNU's technology studies educate world-class creative graduates who can and will contribute to a better world and a sustainable future

These 10 general principles, which are recommended by the FTS as principled guidelines for further development of NTNU's technology studies, read as follows:

Om kandidatenes kompetanse:

1. NTNU's technology studies will actively facilitate candidates, based on a solid academic foundation, to develop comprehensive and integrated competence, including sustainability competence and digital competence at a high level.'
 2. NTNU will actively facilitate that graduates from technology studies develop solid interdisciplinary collaboration competence, and that the overall student population gains a diversity in knowledge profiles, while the individual student achieves sufficient programmatic depth.
-



NTNU – Framtidens teknologiestudier projekt

About the educational learning environment:

3. Contextual learning shall be used as a general pedagogical principle in NTNU's technology studies.
4. NTNU's technology studies shall use knowledge-based, student-active and engaging teaching and assessment methods that are in harmony with the education's overall competence goals, promote a good learning culture, and provide effective in-depth learning.
5. NTNU will set clear expectations for, and provide solid support for, competence development for teaching personnel.

About program design and quality development:

6. The quality of NTNU's technology studies will be developed through a program-driven approach, in combination with strategic portfolio development and management across programs and program types.
 7. NTNU's quality work in technology studies will stimulate the study programmes' development towards world-class educational quality, by focusing on continuous improvement and systematic development of a quality culture
-



NTNU – Framtidens teknologiestudier projekt

About cooperation and interaction – nationally and internationally:

8. NTNU will give high priority to strategic and operational international cooperation on the development of technology studies, with the goal of becoming an internationally visible and recognized university in this area as well.
9. NTNU's technology studies will emphasize systematic interaction with working life and society, with the goal of promoting work relevance, facilitating lifelong learning, and ensuring that students can gain relevant work experience through their studies

About learning environments – physical, digital and psychosocial:

10. NTNU will develop its learning environment, and in particular its campus and infrastructure – both physical and digital – in a direction that supports the other FTS principles I -IX and promotes learning, health and well-being among students and staff.

<https://www.ntnu.no/fremtidensteknologistudier/fts-stotte-til-sentrale-prosesser>



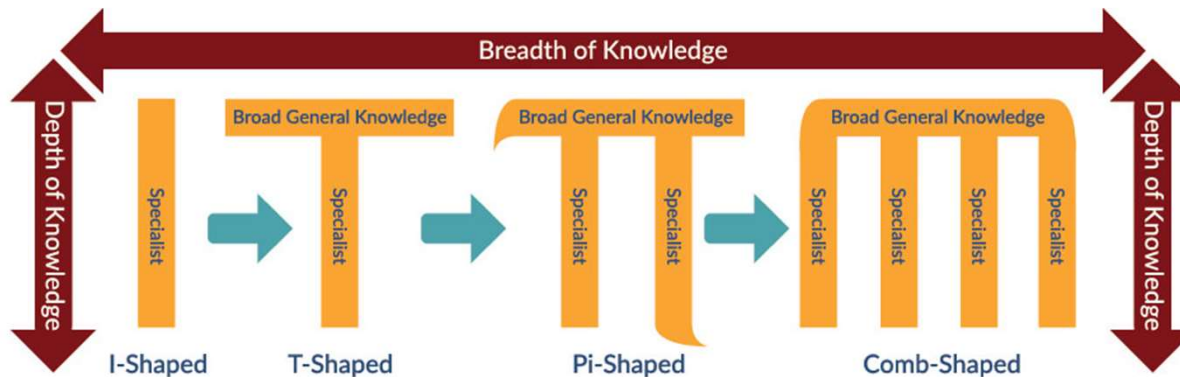
Workshops "Framtidens ingenjör" 2021

4 workshops with strategic partners and other external actors to jointly develop the image of the engineer of the future.

What primary challenges will your engineers work on in 10 years?

What are important knowledge and skills for the engineers of the future?

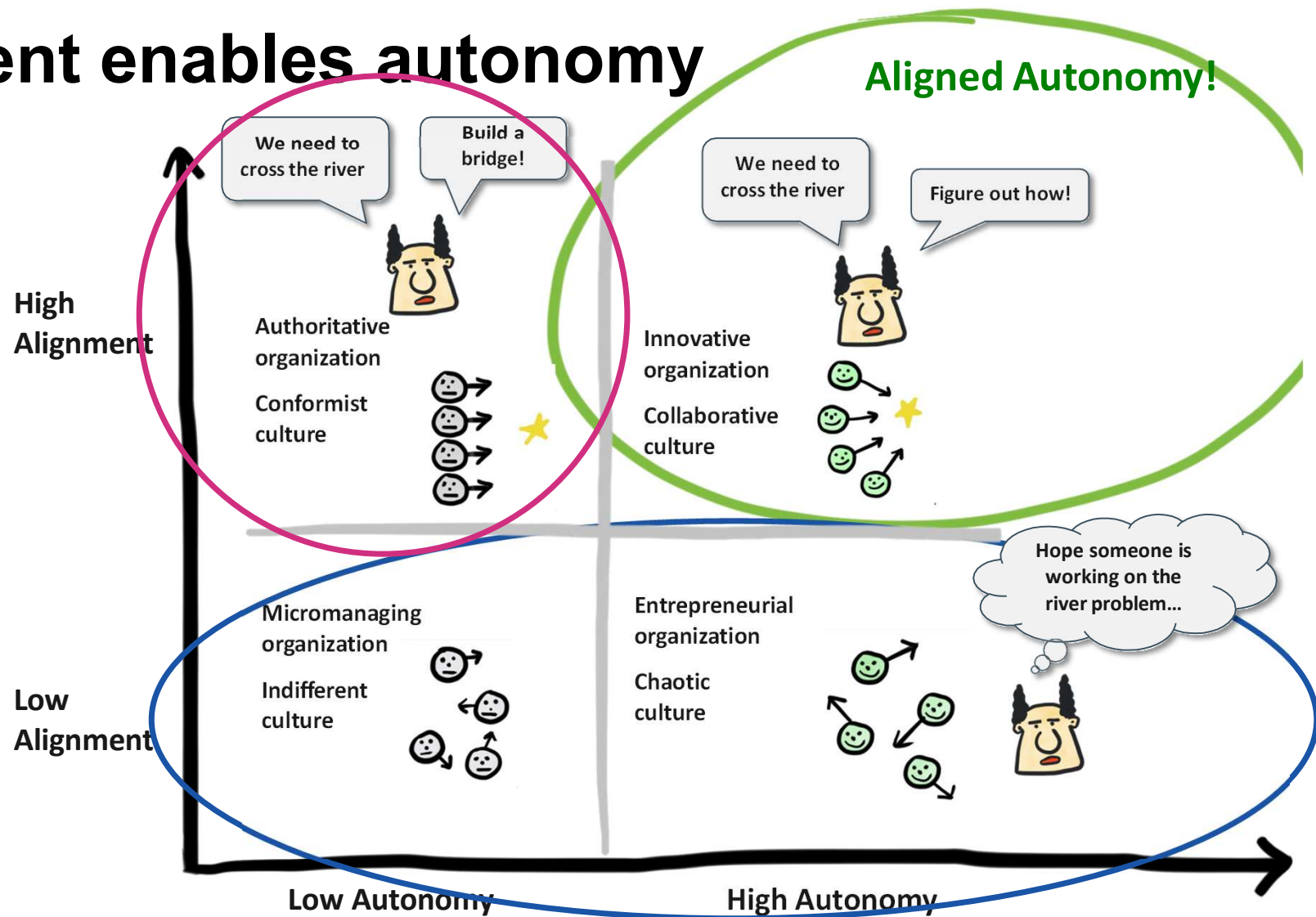
What are the biggest challenges when it comes to the company's supply of future engineering skills?



Alignment enables autonomy

- KTH in the last years?
- This is how many in the faculty experience KTH
- Our goal with the future of education
-

Steering/direction enables autonomy!
=>
Innovative culture of cooperation





Motivation for Future Education

SKO

"... principles that will characterise the work of developing KTH's programmes so that the programmes remain highly relevant and attractive in the increased competition between national and international higher education institutions and new educational actors.

An important starting point for the work is also the importance that education has for a transformation towards a sustainable society, in which KTH will maintain and develop its role."

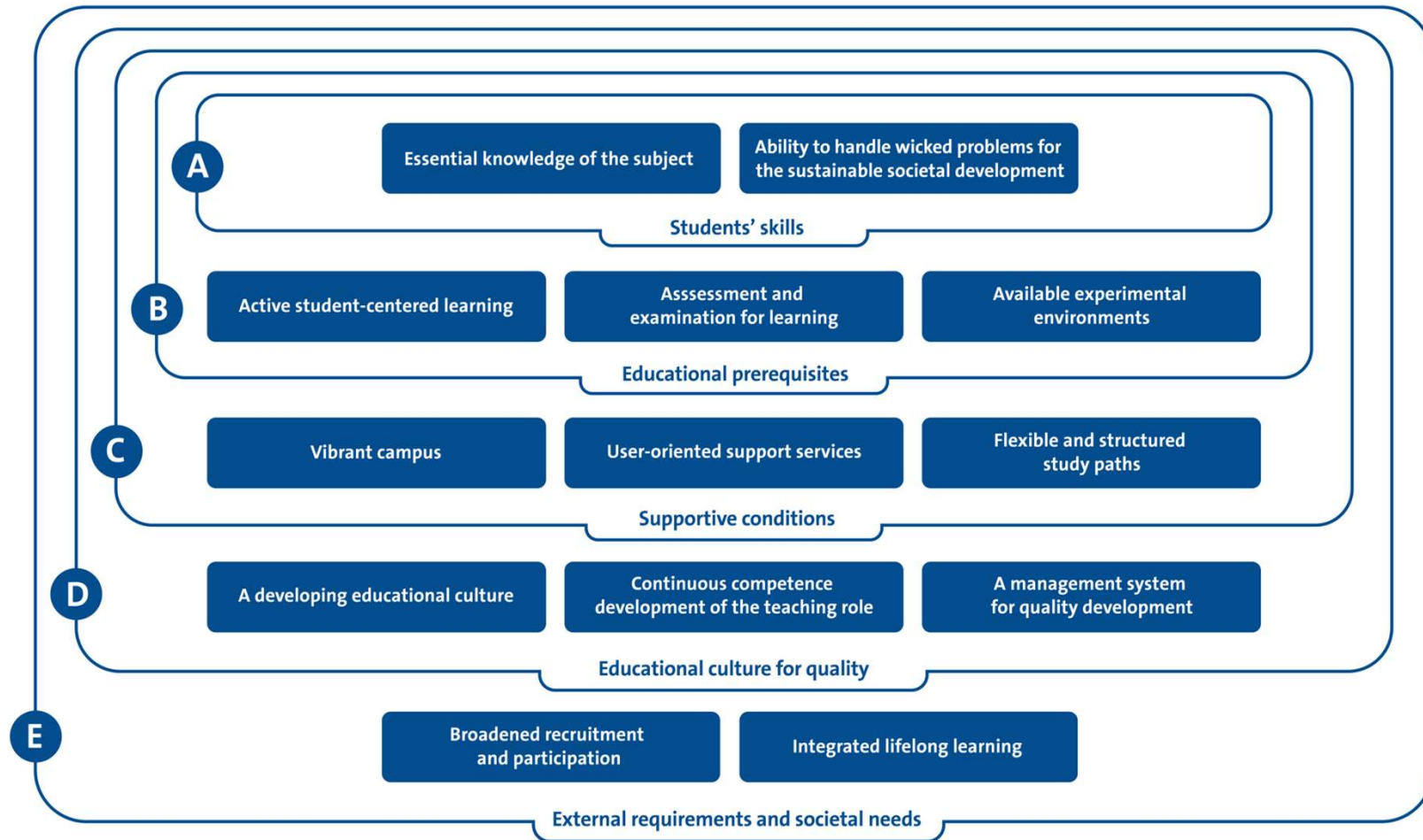
"Decision on principles for future education" (V-2022-0380)

SK0

Bra om vi använder formuleringar/hänvisningar som redan finns i beslut/styrdokument.

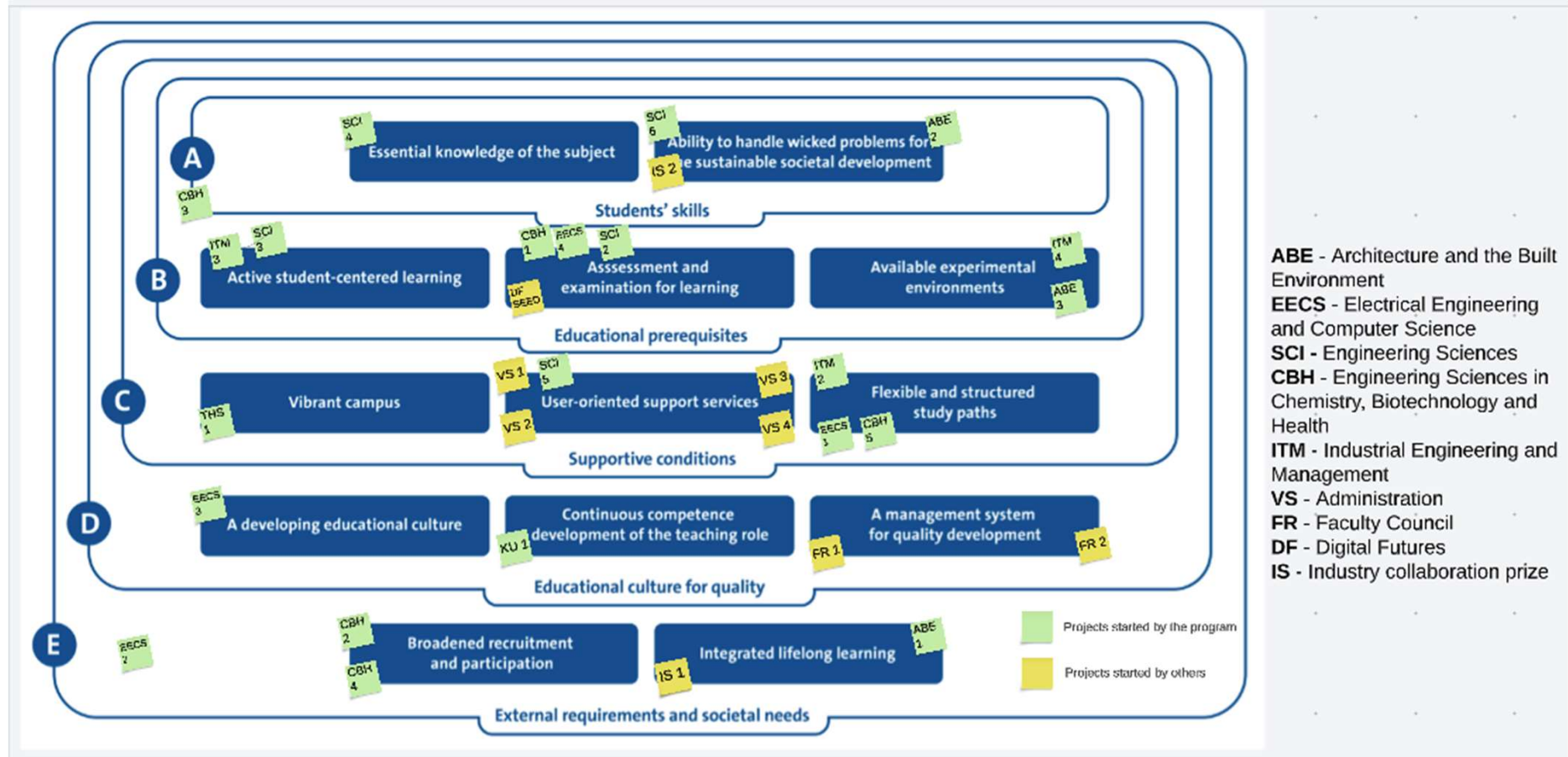
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Principles of the framework





Pilot projects





Summing up

- 3 clear topics of pilot projects:
 - Program development
 - Digitalization
 - Sustainability
- Where is Systems Engineering?
 - No systematic approach today
 - > A intro course in some program and the Vehicle engineering and maybe hidden in some other programs
 - Not a principle in its own
 - > Not a general discussion on the need for it even though dekanus and I pushed for it – especially after our TU/e visit
 - Not explicitly part of any pilot project, however:
 - > A crucial part of the toolbox for principle 2 “Ability to handle wicked problem for a sustainable societal future
 - > Could (or should) be important puzzle pieces in the program development of:
 - Aeronautical Engineering and Aerospace Engineering programmes (project SCI school)
 - New Mechatronics master program
- Systems Engineering has a place in curriculum when training to solve the engineering challenges of the society – but is there room – and what should be taken out of the curriculum?



Questions

